

Amendments to the Claims

Please rewrite the paragraph on page 10, line 22 - page 11, line 17 as follows:

In one preferred embodiment, wafer polisher 44 is a radial belt polisher 47 having a polishing pad 46 mounted on circular disc 90 that rotates in a forward direction F, as illustrated in FIGS. 6 and 7. Circular disc 90 rotates around shaft 92. The pad conditioner 10 is mounted along a radius of circular disc 90, wherein one end of the pad conditioner 10 is mounted to shaft 92. Preferably, the radial belt polisher 47 includes a radial belt 49 mounted onto the circular disc 90, as best illustrated in FIG. 7. The radial belt 49 may also be known as a rotary platform or rotary table. The polishing pad 46 is then mounted onto the radial belt 49 traveling in a forward direction F. The radial belt 49 defines a center C, located at the center of the radial belt 49, as illustrated in FIGS. 6 and 7. In this embodiment, the pad conditioner 10 includes a non-rotatable conditioning member 12 configured to engage the polishing pad 46. Preferably, the conditioning member 12 is mounted radially along the radial belt 49, that is, the centerline G of the conditioning member 12 goes through the center C of the radial belt 49, as illustrated in FIG. 6. The conditioning member 12 including a primary edge 14 opposed to a secondary edge 16, wherein the distance between the primary edge 14 and the secondary edge 16 decreases as the distance from the center C of the radial belt 49 increases. As defined herein the distance between the primary edge 14 and the secondary edge 16, is the distance between a primary point 18 on the primary edge 14 and a secondary point 20 on the secondary edge 16, wherein the primary and secondary points 18, 20 are located on a tangent line 31 that is tangent to the centerline G. Moreover, the distance from the center C of the radial belt 49 is defined herein as the distance from an intersection point 21 that is at the intersection of the tangent line and the centerline G, to the center C of the radial belt 49. In this embodiment, wafer polisher 44 may be a radial belt polisher 47 such as the Mirra polisher available from Applied Materials of Santa Clara, CA. The alignment of the pad conditioner 10 with respect to the polishing pad 46 is best shown in FIG. 6.

Amendments to the Claims

Please rewrite Claims 1, 8, 12, 15 and 19-20 and add Claims 21-26 as follows:

1. (Currently Amended) An apparatus for conditioning a polishing pad used in chemical mechanical planarization of semiconductor wafers, the polishing pad travels in a forward direction, wherein the polishing pad has a first point traveling at a first velocity and a second point traveling at a second velocity, the apparatus comprising:

a non-rotatable conditioning member configured to engage a surface of the polishing pad and forming at least one microchannel in the surface, the microchannel enabling slurry transport and removal of debris or byproducts generated during a chemical mechanical planarization process,

wherein the conditioning member includes a primary edge opposed to a secondary edge,

wherein the first point defines a first path across the conditioning member from the primary edge to the secondary edge as the first point travels in the forward direction, the first path having a first length,

wherein the second point defines a second path across the conditioning member from the primary edge to the secondary edge as the second point travels in the forward direction, the second path having a second length,

wherein the second path does not intersect with the first path, and

wherein the value of the first velocity multiplied by the first length is substantially equal to the value of the second velocity multiplied by the second length.

2. (Original) The apparatus of claim 1, wherein the conditioning member comprises a contact surface configured to engage the polishing pad between the primary edge and the secondary edge.

3. (Original) The apparatus of claim 1, wherein the primary edge and the secondary edge form straight lines.

4. (Original) The apparatus of claim 1, wherein the primary edge and the secondary edge form curved lines.

5. (Original) The apparatus of claim 4, wherein the curved lines are concave.
6. (Original) The apparatus of claim 4, wherein the curved lines are convex.
7. (Original) The apparatus of claim 1, wherein the polishing pad comprises a fixed-abrasive polishing pad.
8. (Currently Amended) An apparatus for conditioning a polishing pad used in chemical mechanical planarization of semiconductor wafers, the polishing pad mounted onto a linear belt traveling in a forward direction, the apparatus comprising:
 - a non-rotatable conditioning member disposed proximate to the polishing pad and comprising a primary edge and a spaced-apart secondary edge, the conditioning member configured to engage a surface of the polishing pad and forming at least one microchannel in the surface, the microchannel enabling slurry transport and removal of debris or byproducts generated during a chemical mechanical planarization process, the conditioning member including a primary edge opposed to a secondary edge,
 - wherein the primary edge and the secondary edge are both in contact with the polishing pad, and wherein the primary edge is generally parallel to the secondary edge.
9. (Original) The apparatus of claim 8, wherein the conditioning member comprises a contact surface configured to engage the polishing pad between the primary edge and the secondary edge.
10. (Original) The apparatus of claim 8, wherein the primary edge and the secondary edge form straight lines.
11. (Original) The apparatus of claim 8, wherein the primary edge and the secondary edge form curved lines.
12. (Currently Amended) The apparatus of claim 8, wherein the polishing pad has a width, and wherein the conditioning member has a width that is equal to or greater than the width of the polishing pad.

13. (Original) The apparatus of claim 8, wherein the polishing pad comprises a wet-abrasive polishing pad.

14. (Original) The apparatus of claim 8, wherein the polishing pad comprises a fixed-abrasive polishing pad.

15. (Currently Amended) An apparatus for conditioning a polishing pad used in chemical mechanical planarization of semiconductor wafers, the polishing pad ~~mounted onto a radial belt traveling in a forward direction, the radial belt defining~~having a center around which the polishing pad rotates, the apparatus comprising:

a non-rotatable conditioning member disposed proximate the polishing pad and comprising a primary edge and a spaced-apart secondary edge, the conditioning member further configured to engage a surface of the polishing pad and forming at least one microchannel in the surface enabling slurry transport and removal of debris or byproducts generated during a chemical mechanical planarization process;

~~the conditioning member mounted radially along the radial belt, the conditioning member including a primary edge opposed to a secondary edge,~~

~~wherein the distance between the primary edge and the secondary edge decreases as the distance from the center of the radial belt increases.~~

16. (Original) The apparatus of claim 15, wherein the conditioning member comprises a contact surface configured to engage the polishing pad between the primary edge and the secondary edge.

17. (Original) The apparatus of claim 15, wherein the primary edge and the secondary edge form straight lines.

18. (Original) The apparatus of claim 15, wherein the primary edge and the secondary edge form curved lines.

19. (Currently Amended) The apparatus of claim 15, wherein the polishing pad has a radius and wherein the conditioning member has a length that ~~this~~ equal to or greater than the radius of the polishing pad.

20. (Currently Amended) A method for conditioning a polishing pad used in chemical mechanical planarization of semiconductor wafers, the method comprising:

providing a non-rotatable conditioning member configured to engage a surface of the polishing pad to be conditioned, the conditioning member including a primary edge opposed to a secondary edge, wherein the primary edge and the secondary edge are both in contact with the polishing pad, and wherein the primary edge is generally parallel to the secondary edge;

moving the polishing pad in a forward direction; and

pressing the conditioning member against the polishing pad to enable slurry transport and removal of debris or byproducts generated during a chemical mechanical planarization process.

21. (New) The apparatus of claim 15, wherein the conditioning member is mounted along an axis passing through the center of the polishing pad.

22. (New) The apparatus of claim 21, wherein a distance between the primary edge and the secondary edge decreases as a distance from the center of the polishing pad increases.

23. (New) The apparatus of claim 15, wherein a distance between the primary edge and the secondary edge changes with increasing distance from the center of the polishing pad.

24. (New) The apparatus of claim 23, wherein the distance between the primary edge and the secondary edge decreases with increasing distance from the center of the polishing pad.

25. (New) The apparatus of claim 1, wherein the conditioning member is mounted above the polishing pad.

26. (New) The apparatus of claim 8, wherein the conditioning member is mounted above the polishing pad.